

Serial No. 10/764,568
July 8, 2005
Reply to the Office Action dated March 16, 2005
Page 7 of 10

REMARKS/ARGUMENTS

Claims 1, 3-11 and 14-20 are pending in this application. By this amendment, Applicants cancel claims 2, 12 and 13 and amend claims 1 and 11.

Claims 1-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hellbaum et al. (U.S. 5,632,841) in view of Nakamura et al. (U.S. 6,744,180) or vice versa. Claims 2, 12 and 13 have been canceled. Applicants respectfully traverse the rejection of claims 1, 3-11 and 14-20.

Claim 1 has been amended to recite:

"A piezoelectric type electroacoustic transducer comprising:
a piezoelectric vibrating plate including a plurality of piezoelectric ceramic layers laminated to each other with an internal electrode interposed between each of the plurality of piezoelectric ceramic layers, and main surface electrodes provided on front and back side main surfaces of the piezoelectric vibrating plate, whereby the piezoelectric vibrating plate is surface-flexural-vibrated in a thickness direction thereof with an AC signal applied between the main surface electrodes and the internal electrode; and

a box including supporting portions on which the outer peripheral portions of the back side of the piezoelectric vibrating plate is supported, **the piezoelectric vibrating plate having a protecting film provided on both of the front and back side surfaces of the piezoelectric vibrating plate**, the protecting film being formed by applying a paste resin in a film-shape and hardening the resin, or by bonding an adhesive sheet and hardening the sheet, and the piezoelectric vibrating plate is warped on the front-side thereof by the hardening shrink stresses of the protecting films; wherein

the protecting film on the back side surface has a thickness that is greater than that of the protecting film on the front side surface." (emphasis added)

Applicants' claim 11 recites features that are similar to the features recited in Applicants' claim 1, including the above-emphasized features.

With the unique combination and arrangement of features recited in Applicants' claims 1 and 11, including the features of "the piezoelectric vibrating plate having a protecting film provided on both of the front and back side surfaces of the piezoelectric

Serial No. 10/764,568
July 8, 2005
Reply to the Office Action dated March 16, 2005
Page 8 of 10

vibrating plate" and "the protecting film on the back side surface has a thickness that is greater than that of the protecting film on the front side surface," Applicants have been able to provide a piezoelectric type electroacoustic transducer in which the deflecting direction of the piezoelectric vibrating plate is controlled, the sound pressure is high at a low frequency, and the dispersion of the resonant frequency is greatly reduced (see, for example, the third full paragraph on page 3 of the originally filed specification).

The Examiner alleged that Hellbaum et al. teaches all of the features recited in Applicants' claims 1 and 11, except for the housing. The Examiner further alleged that Nakamura et al. teaches that "the specific housing is known per se." Thus, the Examiner concluded that it would have been obvious to provide Hellbaum et al. with a housing as taught by Nakamura et al.

Claim 1 has been amended to recite the features of "the piezoelectric vibrating plate having a protecting film provided on both of the front and back side surfaces of the piezoelectric vibrating plate" and "the protecting film on the back side surface has a thickness that is greater than that of the protecting film on the front side surface." Claim 11 has been similarly amended.

In contrast to Applicants' claims 1 and 11, Hellbaum et al. teaches a piezoelectric vibrating plate 12 having electrodes 18a and 18b disposed on front and back side surfaces of the piezoelectric vibrating plate 12, respectively, and a pre-stress layer 14 disposed on only a back side surface of the piezoelectric vibrating plate 12 with the electrode 18b disposed therebetween. Although it is unclear from the Examiner's description of the prior art rejection, it appears that the Examiner is alleging that the pre-stress layer 14 corresponds to the protecting film recited in Applicants' claims 1 and 11.

Even assuming *arguendo* that the pre-stress layer 14 of Hellbaum et al. could be fairly construed as a protecting film, the device of Hellbaum et al. does not include any film or layer on the front surface of the piezoelectric vibrating plate 12, and certainly does not include a protecting film on the front side surface of the piezoelectric vibrating plate 14. Thus, at best, Hellbaum et al. teaches a protecting film on only the

Serial No. 10/764,568

July 8, 2005

Reply to the Office Action dated March 16, 2005

Page 9 of 10

back side surface of the piezoelectric vibrating plate 12, and clearly fails to teach or suggest the feature of "the piezoelectric vibrating plate having a protecting film provided on **both of the front and back side surfaces** of the piezoelectric vibrating plate" (emphasis added) as recited in Applicants' claim 1, and similarly in Applicants' claim 11.

Since Hellbaum et al. fails to teach or suggest any protecting film on the front side surface of the piezoelectric vibrating plate 12, Hellbaum et al. certainly fails to teach or suggest the feature of "the protecting film on the back side surface has a thickness that is greater than that of the protecting film on the front side surface" as recited in Applicants' claim 1, and similarly in Applicants' claim 11.

Nakamura et al. teaches protecting films 8 and 9 disposed on front and back side surfaces of the piezoelectric vibrating plates 1a and 1b. However, as clearly seen in Fig. 3 of Nakamura et al., the protecting films 8 and 9 of Nakamura et al. have the exact same thickness. Thus, Nakamura et al. clearly fails to teach or suggest the feature of "the protecting film on the back side surface has a thickness that is greater than that of the protecting film on the front side surface" (emphasis added) as recited in Applicants' claim 1, and similarly in Applicants' claim 11.

Accordingly, Applicants respectfully submit that Hellbaum et al. and Nakamura et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in Applicants' claims 1 and 11.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Hellbaum et al. in view of Nakamura et al. or vice versa.

In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 1 and 11 are allowable. Claims 3-10 and 14-20 depend upon claims 1 and 11, and are therefore allowable for at least the reasons that claims 1 and 11 are allowable.

In view of the foregoing amendments and remarks, Applicants respectfully submit

Serial No. 10/764,568
July 8, 2005
Reply to the Office Action dated March 16, 2005
Page 10 of 10

that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

To the extent necessary, Applicants petition the Commissioner for a One-month extension of time, extending to July 16, 2005, the period for response to the Office Action dated March 16, 2005.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Date: July 8, 2005


Attorneys for Applicant

Joseph R. Keating
Registration No. 37,368

Christopher A. Bennett
Registration No. 46,710

KEATING & BENNETT LLP
10400 Eaton Place, Suite 312
Fairfax, VA 22030
Telephone: (703) 385-5200
Facsimile: (703) 385-5080